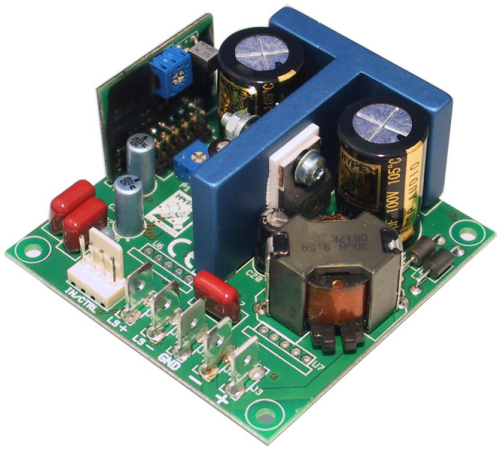
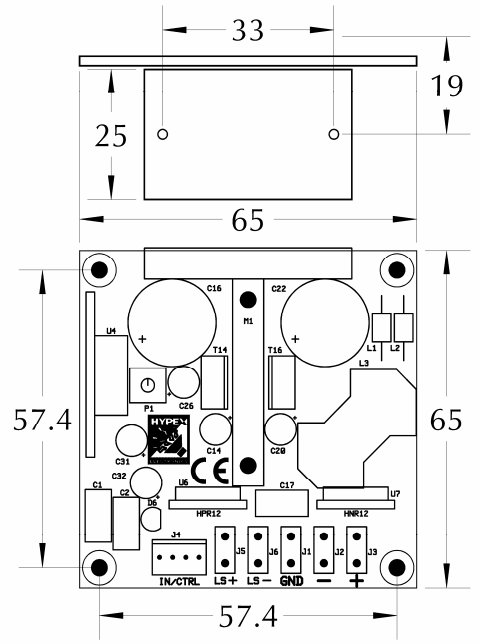
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UcD®180 High Grade Version

High Grade Audio Power Amplifier Module





Highlights

- Flat, fully load-independent frequency response
- Low output impedance
- Very low, frequency-independent THD
- Very low noise
- Fully passive loop control
- Consistent top performer in listening trials

Features

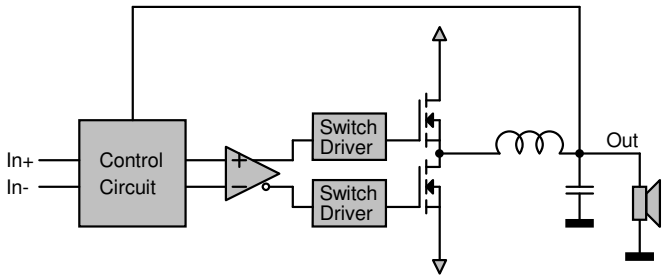
- Runs on unregulated +/- rails
- Pop-free start and stop control
- Differential audio input
- No compromise components
- LM4562 buffer OpAmp
- HxR12 ready
- Improved on-board buffer supply
- Overcurrent and overvoltage protection
- Weight: 90gms (3.1oz.)

Applications

- Monitor loudspeakers for recording and mastering studios
- Audiophile power amplifiers for professional and consumer use
- Public Address systems
- Home theatre systems
- Active loudspeakers

Description

The UcD180HG amplifier module is a self-contained high-performance class D amplifier intended for a wide range of audio applications, ranging from Public Address systems to ultrahigh-fidelity replay systems for studio and home use. Chief distinguishing features are flat frequency response irrespective of load impedance, nearly frequency-independent distortion behaviour and very low radiated and conducted EMI. Control is based on a phase-shift controlled self-oscillating loop taking feedback only at the speaker output.



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1 Performance data

Power supply = +/-45V, Load=4Ω, MBW=40kHz, unless otherwise noted

Item	Symbol	Min	Typ	Max	Unit	Notes
Output Power	P_R	-	180	-	W	THD=1%, Load=4Ω
		-	120	-	W	THD=1%, Load=8Ω
Distortion	THD+N	-	0.1	0.15	%	20Hz<f<20kHz [1] Pout<P_R/2
		-	0.008	0.01	%	20Hz<f<20kHz. Pout=1W
Output noise	U_N	-	30	35	µV	Unwtd, 20Hz-20kHz
Output Impedance	Z_{OUT}	-	-	20	mΩ	f<1kHz
		-	-	150	mΩ	f<20kHz
Power Bandwidth	PBW		20-35k		Hz	[2]
Frequency Response		10	-	50k	Hz	+0/-3dB. All loads
Voltage Gain	A_V	25.5	26	26.5	dB	
Supply Ripple Rejection	PSRR		65		dB	Either rail, all frequencies
Efficiency	η		92		%	Full power
Idle Losses	P_0		4		W	
Standby Current	I_{STBY}		10		mA	
Current Limit			10		A	Stop mode after limiting 40ms.

Note 1: At higher audio frequencies there are not enough harmonics left in the audio band to make a meaningful THD measurement. High frequency distortion is therefore determined using a 18.5kHz+19.5kHz 1:1 two-tone IMD test.
Note 2: Dielectric losses in the output capacitor limit long term (>30s) full-power bandwidth to 15kHz.

2 Absolute maximum ratings

Correct operation at these limits is not guaranteed. Operation beyond these limits may result in irreversible damage

Item	Symbol	Rating	Unit	Notes
Power supply voltage	V_B	+/-56	V	Unit shuts down when either rail exceeds 56V
Peak output current	$I_{OUT,P}$	10	A	Unit current-limits at 10A
Input voltage	V_{IN}	+/-12	V	Either input referred to ground
Air Temperature	T_{AMB}	65	ºC	
Heat-sink temperature	T_{SINK}	90	ºC	User to select heat sink to insure this condition under most adverse use case

3 Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit	Notes
Power supply voltage	V_B	30 [1]	45	49 [2]	V	
Load impedance	Z_{LOAD}	1			Ω	

Source impedance	Z_{SRC}			7	kΩ	Differential. Corresponds to 3dB noise increase.
Effective power supply storage capacitance	C_{SUP}	4700			µF	Per rail, per attached amplifier. 4Ω load presumed.

Note 1: Unit shuts down when either rail drops below 25V.
Note 2: Unit shuts down when either rail exceeds 56V.

4 Connections

4.1 J4: Input and ON/OFF control

Connector type: 4-pin MOLEX® KK® series, part number 22-27-2041.

Pin	Function
1	ON/OFF control [1)]
2	Inverting Audio Input
3	GND
4	Noninverting Audio Input

Note 1: During initial power up this pin is disabled for a period of 1.5s. Unlike previous UcD180 models there is no delay after enabling the amplifier.

4.2 Input Characteristics

Item	Symbol	Min	Typ	Max	Unit	Notes
Input Impedance	Z_{IN}		100		kÙ	Either input to ground
Common Mode Rejection Ratio	CMRR		75		dB	All frequencies
Control voltage on pin 4, amplifier ON				3	V	
Control voltage on pin 4, amplifier OFF		12			V	Internally pulled up to 12V

Note: It is recommended to use an open collector output to control the on/off pin.

4.3 J5: Loudspeaker output (hot)

Connector type: 6,3x0,8 FASTON® tab.

4.4 J6: Loudspeaker output (cold)

Connector type: 6,3x0,8 FASTON® tab.
Internally connected to GND. Note: This is the feedback reference. For best performance, do not use another ground connection for the loudspeaker.

4.5 J3: Positive power supply connection, +VB

Connector type: 6,3x0,8 FASTON® tab.

4.6 J2: Negative power supply connection, -VB

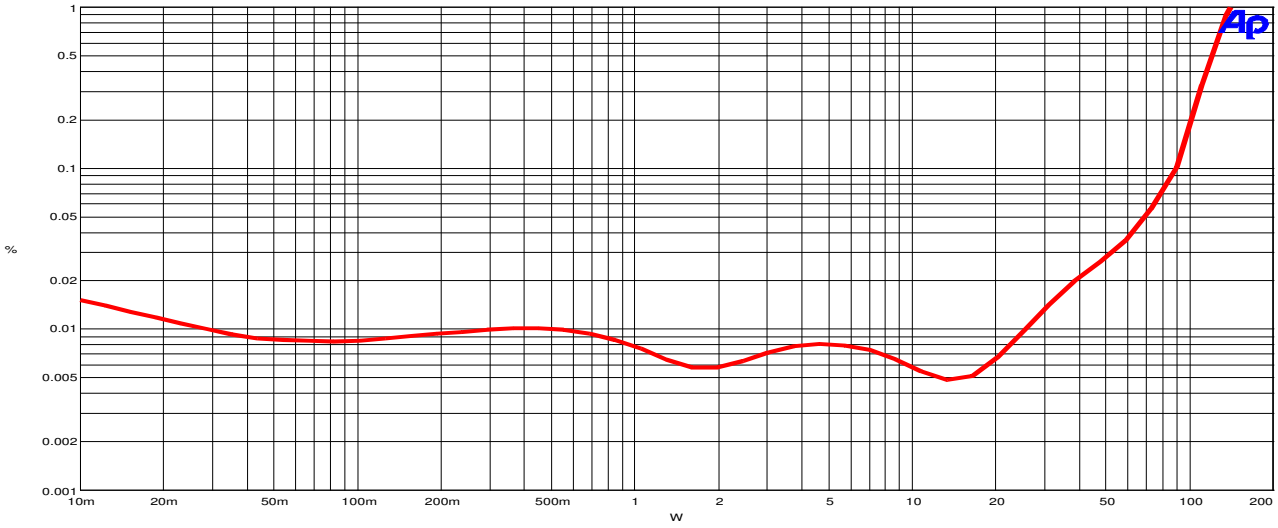
Connector type: 6,3x0,8 FASTON® tab.

4.7 J1: Power supply ground connection, GND

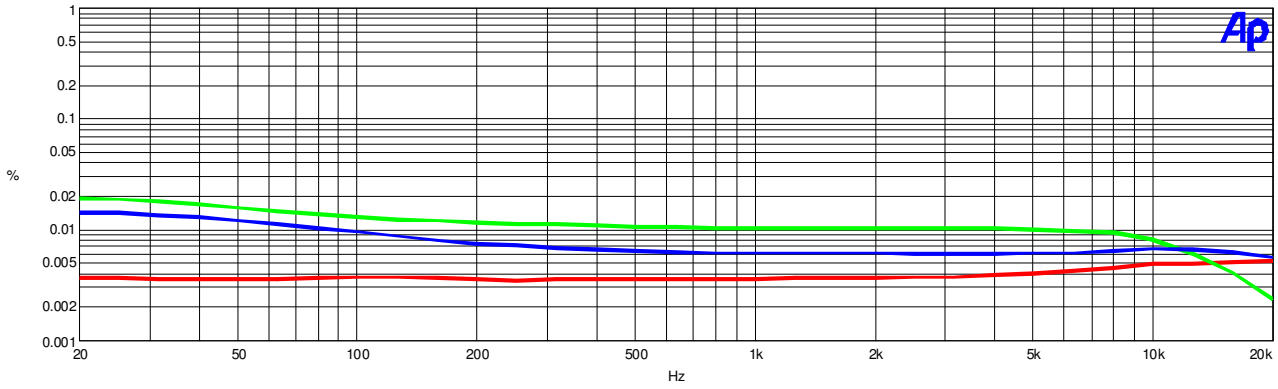
Connector type: 6,3x0,8 FASTON® tab.

5 Typical Performance Graphs

5.1 THD vs. Power (1kHz, 4Ω)

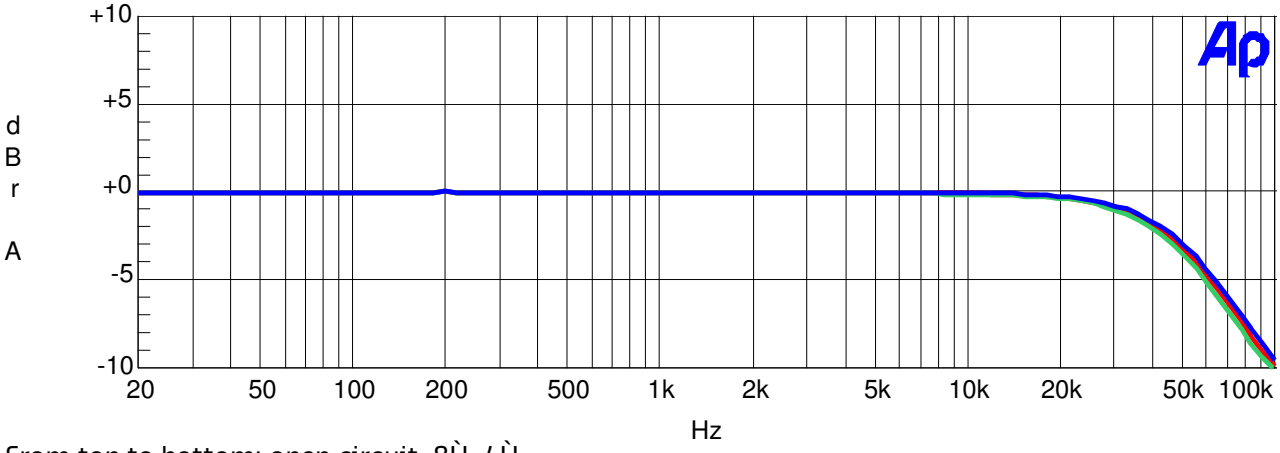


5.2 THD vs. Frequency (8Ù)



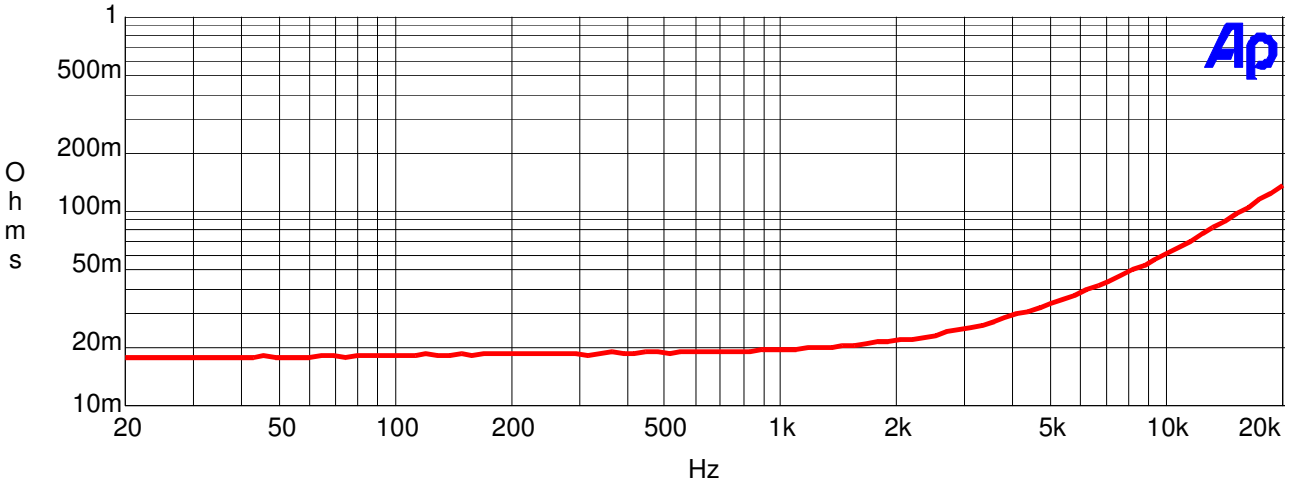
From top to bottom: 40W, 10W, 1WFrequency Response (4Ù, 8Ù and open circuit)

5.3 Frequency Response (4Ω, 8Ω and open circuit)

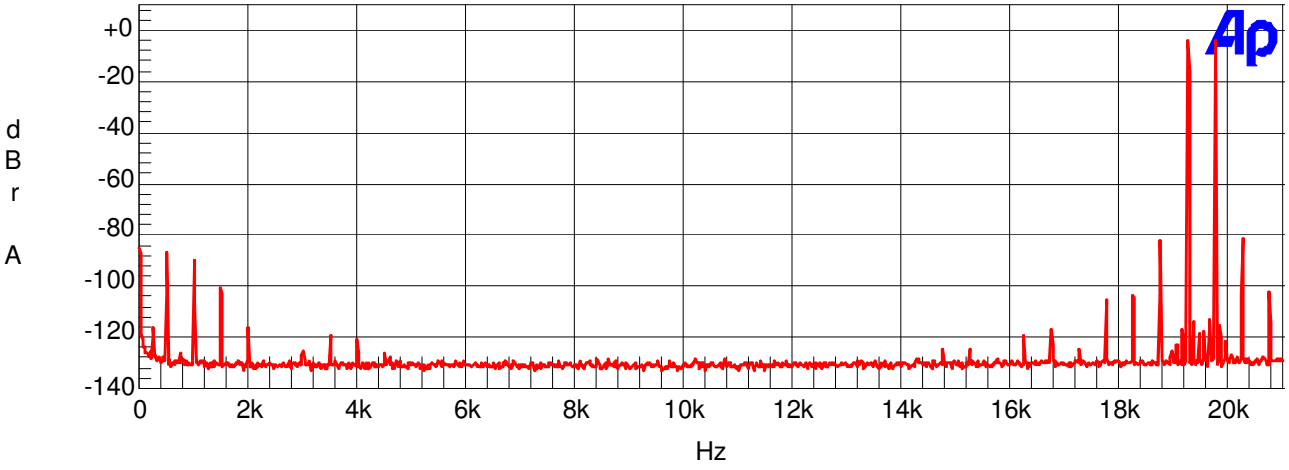


From top to bottom: open circuit, 8Ù, 4Ù

5.4 Output Impedance



5.5 19+20kHz IMD (10W, 4 ohms)



DISCLAIMER: This subassembly is designed for use in music reproduction equipment only. No representations are made as to fitness for other uses. Except where noted otherwise any specifications given pertain to this subassembly only. Responsibility for verifying the performance, safety, reliability and compliance with legal standards of end products using this subassembly falls to the manufacturer of said end product.

LIFE SUPPORT POLICY: Use of Hypex products in life support equipment or equipment whose failure can reasonably be expected to result in injury or death is not permitted except by explicit written consent from Hypex Electronics BV.

Document Revision	PCB Version	Description	Date
R1	UcD180HGV1/2	Initial draft.	
R2	UcD180HGV2: SN from 10091252_0001	- OVP level increased to 56V to for compatibility reasons SMPS400/49. - Input resistor values changed.	29.04.2009
R3	UcD180HGV2	Format changed	09.03.2012